CLAIMS

1. A positive electrode for a lead-acid battery comprising a heat-treated metal grid having an interconnected grain structure, wherein said grid is heat-treated after being at least partially coated with a paste comprising lead.

2. The positive electrode of claim 1, wherein said heat-treated metal grid comprises lead.

3. The positive electrode of claim 2, wherein said heat-treated metal grid further comprises tin, calcium, or a combination comprising at least one of the foregoing.

4. The positive electrode of claim 3, wherein said heat-treated metal grid comprises at least about 98.5% by weight lead, at least about 1.5% by weight tin, and at least about 0.08% by weight calcium.

5. The positive electrode of claim 1, wherein said heat-treated metal grid prior to heat-treating, is comprised of expanded metal.

6. The positive electrode of claim 1, wherein said paste further comprises lead oxides, water, sulfuric acid, or combinations comprising at least one of the foregoing.

7. The positive electrode of claim 1, wherein said paste coated grid is heating at about 35°C to about 75°C, and at about 10% to about 90% humidity, for a time sufficient to cure said paste onto the surface of said grid prior to heat treating said grid.

8. The positive electrode of claim 1, wherein said grid is heat-treated at a temperature of at least about 150°C, for a period of time sufficient to produce said interconnected grain structure within said heat-treated grid.

9. The positive electrode of claim 8, wherein said heat-treated grid is assembled into an electrochemical cell having a negative electrode and a sulfuric acid containing electrolyte, wherein an electric current is passed through said cell such that at least a portion of said paste is converted into lead dioxide.

10. The positive electrode of claim 1, wherein said heat-treated metal grid, assembled into a cell according to test J-240, has an expiration time of at least 2000 cycles wherein said test J-240 is conducted at 75°C.

11. The positive electrode of claim 1, wherein said interconnected grain structure is a recystallized interconnected grain structure.

12. A method of making a positive electrode for a lead-acid battery comprising:

applying a lead containing paste to a metal grid to produce a pasted grid;

heating said pasted grid at a temperature and relative humidity sufficient to produce a cured grid;

heat treating said cured grid at a temperature of at least about 125°C, for a period of time sufficient to produce an interconnected grain structure within said grid to produce a heat treated grid; and

forming said electrode by assembling said heat treated grid into an electrochemical cell comprising a negative electrode and a sulfuric acid electrolyte, wherein an electric current is passed through said cell to convert at least a portion of said cured paste into a coating of lead oxides.

13. The method of claim 12, wherein said metal grid comprises lead.

14. The method of claim 13, wherein said metal grid further comprises tin, calcium, or a combination comprising at least one of the foregoing.

15. The method of claim 14, wherein said metal grid comprises about 98.5% by weight lead, about 1.5% by weight tin, and about 0.08% by weight calcium.

16. The method of claim 12, wherein said metal grid is comprised of expanded metal.

17. The method of claim 12, wherein said paste further comprises lead oxides, water, sulfuric acid, or combinations comprising at least one of the foregoing.

18. The method of claim 12, wherein said pasted grid is heated to a temperature between about 35°C and about 75°C, at between about 10% and about 90% humidity, for a time sufficient to produce said cured grid.

19. The method of claim 12, wherein said cured grid is heat-treated at a temperature at least about 150°C, for a period of time sufficient to produce said interconnected grain structure within said heat-treated grid.

20. The method of claim 12, wherein said heat-treated metal grid, assembled into a cell according to test J-240, has an expiration time of at least about 2000 cycles when said test J-240 is conducted at 75°C.

21. The method of claim 12, wherein said interconnected grain structure is a recystalized interconnected grain structure.